



2814  
#

**PIPER RUDNICK LLP**  
1200 NINETEENTH STREET, NW  
WASHINGTON, DC 20036-2412  
TELEPHONE: 202-861-3900  
FACSIMILE: 202-223-2085

DOCKET NO.: 8543-004-27 CIP

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

Re: Serial No.: 08/825,360  
Applicant(s): Marvin LIAO, et al.  
Filing Date: March 28, 1997  
For: INTERCONNECT STRUCTURE FOR USE IN AN INTEGRATED  
CIRCUIT  
Group Art Unit: 2814  
Examiner: Tuan N. Quach

SIR:

Attached hereto for filing are the following papers:

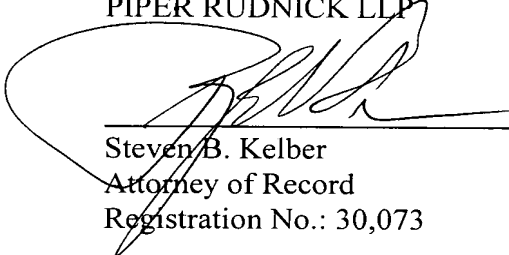
FEE TRANSMITTAL  
INFORMATION DISCLOSURE STATEMENT  
STATEMENT OF RELEVANCY  
FORM PTO 1449  
CITED DOCUMENTS (25)

RECEIVED  
SEP 30 2002  
TECHNOLOGY CENTER 2800

Our check in the amount of \$ 180.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

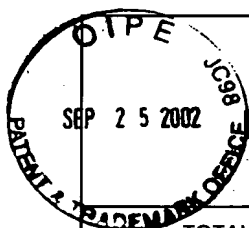
Respectfully submitted,

PIPER RUDNICK LLP



Steven B. Kelber  
Attorney of Record  
Registration No.: 30,073

Perry E. Van Over  
Registration No.: 42,197



# FEE TRANSMITTAL

Docket No.	8543-004-27 CIP
Serial No.	08/825,360
Filing Date	March 28, 1997
Inventor(s)	Marvin LIOA, et al.
Group Art Unit	2814
Examiner	Tuan N. QUACH

TOTAL AMOUNT OF PAYMENT

\$180.00

1. ☐ Applicant claims small entity status.☒ Charge any **UNDERPAYMENT** or credit any **OVERPAYMENT** in the indicated fees to Deposit Account No. 50-1442.☐ Charge the indicated fees to Deposit Account No. 50-1442.2. ☒ Check enclosed.**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity		Small Entity		Fee Description
--------------	--	--------------	--	-----------------

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
----------	----------	----------	----------	-----------------	----------

**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity		Small Entity		Fee Description
--------------	--	--------------	--	-----------------

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
105	130	205	65	Surcharge-late filing fee or oath	
127	50	227	25	Surcharge-late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2520	147	2520	Ex parte reexam. fee	
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	

**SUBTOTAL (1)**

\$0.00

**2. EXTRA CLAIM FEES**

tot. claims	-	20*	=	0	x	\$18	=	0	121	280	221	140	Request for Oral Hearing
ind. claims	-	3*	=	0	x	\$84	=	0	142	1280	242	640	Utility/Reissue Issue Fee

<input type="checkbox"/>	Multiple Dependent Claims	\$280	=		143	460	243	230	Design Issue Fee
--------------------------	---------------------------	-------	---	--	-----	-----	-----	-----	------------------

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	*Reissue independent claims over original patent
110	18	210	9	*Reissue claims in excess of 20 and over original patent

**SUBTOTAL (2)**

\$0.00

OTHER (indicate below):

\* or number previously paid, if greater; For Reissues, see above

**SUBTOTAL (3)**

\$180.00

Name	Steven B. Kelber	Registration No.	30,073
Signature		Date	Sept 25, 2002
Name	Perry E. Van Over	Registration No.	42,197

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION: Marvin LIAO, et al.

GROUP ART UNIT: 2814

SERIAL NUMBER: 08/825,360

EXAMINER: Tuan N. Quach

FILED: March 28, 1997

FOR: INTERCONNECT STRUCTURE FOR USE IN AN INTEGRATED CIRCUIT

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. 1.97Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Applicant(s) wish(es) to disclose the following information.

REFERENCES

- ☒ Applicant(s) wish(es) to make of record the documents listed on the attached Form PTO-1449. Copies of the listed documents are attached, where required, as are either statements of relevancy or any readily available full or partial English translations of any non-English-language documents.

RELATED CASES

- ☐ Attached is a list of Applicant's(s') pending applications and issued patents which may be related to the present application. Copies of the documents, where required, are attached along with Form PTO-1449.

CERTIFICATION

The undersigned certifies that

- ☐ each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign or international patent office in a counterpart foreign or international application for the first time (to the knowledge of the undersigned, having made reasonable inquiry) not more than three months prior to the filing of this statement.
- ☐ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign or international patent office in a counterpart foreign or international application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement.

BASIS FOR CONSIDERATION

This Information Disclosure Statement is filed:

- ☐ without fee and within three months of the filing date of the application.
- ☐ without fee and within three months of the date of entry of the U.S. national stage.
- ☐ without fee and before the mailing date of a first Office Action on the merits (to the knowledge of the undersigned).
- ☐ without fee and with the appropriate certification above.
- ☐ without fee and with a new CPA application.
- ☐ without fee and with a Request for Continued Examination.
- ☒ with fee and before the mailing date of any of a Final Office Action, Notice of Allowance or an action that otherwise closes prosecution (to the knowledge of the undersigned).
- ☐ with fee, appropriate certification above, and before payment of the Issue Fee.

DEPOSIT ACCOUNT

- ☒ Please charge any additional fees for the papers being filed herewith and for which no check is enclosed herewith, or credit any overpayment to Deposit Account No. 50-1442.


09/26/2002 KZENDIE 00000022 08825360

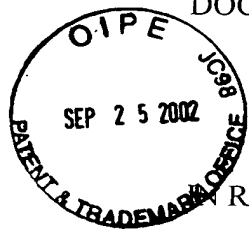
01 FC:126

180.00 OP

Respectfully submitted,

PIPER RUDNICK LLP

  
Steven B. Kelber  
Attorney of Record  
Registration No. 30,073  
Perry E. Van Over  
Registration No. 42,1971200 Nineteenth Street, N.W.  
Washington, DC 20036-2412  
Telephone No. (202) 861-3900  
Facsimile No. (202) 223-2085RECEIVED  
SEP 30 2002  
TECHNOLOGY CENTER 2800#38  
3/6/03  
OIPF  
SEP 25 2002  
PATENT & TRADEMARK OFFICE 8600



DOCKET NO. 8543-004-27 CIP

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RE APPLICATION OF: Marvin LIOA, et al.

ART UNIT: 2814

SERIAL NO.: 08/825,360

EXAMINER: Tuan N. Quach

FILING DATE: March 28, 1997

FOR: INTERCONNECT STRUCTURE FOR USE IN AN INTEGRATED CIRCUIT

STATEMENT OF RELEVANCY

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

SIR:

This Statement of Relevancy is herewith submitted with the concurrently filed Information Disclosure Statement. The below cited German language article is submitted for consideration in the examination of the present application. An English language translation of the article could not be located.

Rie, K.-T., et al., "Abscheidung von Titannitridschichten mittels Plasma-CBD",  
HTM, 42, 153-159 (1987).

The above cited article is directed to plasma enhanced chemical vapor deposition (CVD) of hard coatings. The article discloses equipment and methods which permits the deposition temperature of the CVD process of titanium nitride to be lowered to 500 - 600 ° C by use of direct current glow discharge. The pulsed plasma CVD process discussed in the paper suggest the possibility for process parameter optimization. As such, while the *Rie* reference teaches background knowledge of such processes, it fails to teach or suggest the Applicants' present invention.

RECEIVED  
SEP 30 2002  
TECHNOLOGY CENTER 2800

Consideration of the above cited references with all Information Disclosure Materials  
concurrently filed is respectfully requested.

Respectfully submitted,

PIPER RUDNICK LLP

A handwritten signature in black ink, appearing to read 'S. Kelber', is written over a horizontal line.

Steven B. Kelber  
Registration No. 30,073  
Attorney of Record

1200 Nineteenth Street, N.W.  
Washington, D.C. 20036-2412  
Telephone No. (202) 861-3900  
Facsimile No. (202) 223-2085

Perry E. Van Over  
Registration No. 42,197

Form PTO 1449 U.S. DEPARTMENT OF  
(Modified) COMMERCE  
PATENT AND TRADEMARK  
OFFICE

DOCKET NO.

8543-004-27 CIP

SERIAL NO.

08/825,360

APPLICANT

Marvin LIAO, et al.

FILING DATE

March 28, 1997

GROUP ART UNIT

2814

LIST OF REFERENCES CITED BY APPLICANT  
(Use Several Sheets if Necessary)

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	AA	4,173,661	11/1979	Bourdon			
	AB	4,420,498	12/1983	Hirose, et al.			
	AC	4,486,462	12/1984	Asahi, et al.			
	AD	4,965,090	10/1990	Gärtner, et al.			
	AE	5,017,403	5/1991	Pang, et al.			
	AF	5,314,603	5/1994	Sugiyama, et al.			
	AG	5,480,684	1/1996	Sandhu			
	AH	5,518,936	5/1996	Yamamoto, et al.			
	AI	5,576,071	11/1996	Sandhu			
	AJ	5,693,541	12/1997	Yamazaki, et al.			
	AK	5,716,870	2/1998	Foster, et al.			
	AL	5,747,116	5/1998	Sharan, et al.			
	AM	5,754,390	5/1998	Sandhu, et al.			
	AN	5,773,363	6/1998	Derderian, et al.			
	AO	6,251,758 B1	6/2001	Chern, et al.			

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION YES NO	
	AP	EP0397131 A2	11/1990	Europe	X	
	AQ	EP0711846 A1	5/1996	Europe	X	
	AR	JP63-229814	9/1988	Japan		X**
	AS	JP3-135018	6/1991	Japan		X**
	AT	JP4-100221	4/1992	Japan		X**
	AU	JP6-120152	4/1994	Japan		X**

## OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

	AV	Wang, C.K., et al., "Optimization of PVD Ti/CVD TiN Liner for 0.35 $\mu$ m Tungsten Plug Technology", Mat. Res. Society Symp. Proc., Vol. 427, p. 383-387 (1996).
--	----	---

EXAMINER

DATE CONSIDERED

\*EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

\*\*English Abstract Provided

Form PTO 1449

U.S. DEPARTMENT OF  
COMMERCE  
PATENT AND TRADEMARK  
OFFICE

(Modified)

DOCKET NO.

8543-004-27 CIP

SERIAL NO.

08/825,360

APPLICANT

Marvin LIAO, et al.

FILING DATE

March 28, 1997

GROUP ART UNIT

2814

LIST OF REFERENCES CITED BY APPLICANT  
(Use Several Sheets if Necessary)

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	AW						
	AX						
	AY						
	AZ						
	BA						
	BB						
	BC						
	BD						
	BE						
	BF						

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION YES NO
	BG				
	BH				
	BI				
	BJ				
	BK				

## OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

	BL	Danek, M., et al., "Resistivity Reduction and Chemical Stabilization of Organometallic Chemical Vapor Deposited Titanium Nitride by Nitrogen RF Plasma", Appl. Phys. Lett. 68 (7), (1996).
	BM	Eizenberg, M., "Chemical Vapor Deposition of TiN for ULSI Applications", Mat. Res. Soc. Symp. Proc., Vol. 427, p. 325-335 (1996).
	BN	Rie, K.-T., et al., "Abscheidung von Titannitridschichten mittels Plasma-CVD", HTM, 42, 153-159 (1987).
	BO	
	BP	

EXAMINER

DATE CONSIDERED

\*EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.